DEPARTMENT OF ECOLOGY
State of Washington

Voluntary Cleanup Program

Washington State Department of Ecology
Toxics Cleanup Program

REQUEST FOR OPINION FORM

Use this form to request a written opinion on your planned or completed independent remedial action under the Voluntary Cleanup Program (VCP). Attach to this form the plans or reports documenting the remedial action. Please submit only one form for each request.

Step 1: IDENTIFY HAZARDOUS WASTE SITE

Please identify below the hazardous waste site for which you are requesting a written opinion under the VCP. This information may be found on the VCP Agreement.

Facility/Site Name: Mason County Transportation	
Facility/Site Address: 3740 Shelton Springs Road	
Facility/Site No:	VCP Project No.: 0579

Step 2: REQUEST WRITTEN OPINION ON PLAN OR REPORT

What type of independent remedial action plan or report are you submitting to Ecology for review under the VCP? Please check all that apply.

- ☐ Remedial investigation plan
- ☐ Remedial investigation report
- ☒ Feasibility study report
- ☐ Property cleanup* plan (* cleanup of one or more parcels located within the Site)
- ☐ Property cleanup* report
- ☐ Site cleanup plan
- ☐ Site cleanup report
- ☐ Other – please specify:

Do you want Ecology to provide you with a written opinion on the planned or completed independent remedial action?

☒ Yes ☐ No

Please note that Ecology's opinion will be limited to:

- Whether the planned or completed remedial action at the site meets the substantive requirements of the Model Toxics Control Act (MTCA), and/or
- Whether further remedial action is necessary at the site under MTCA.

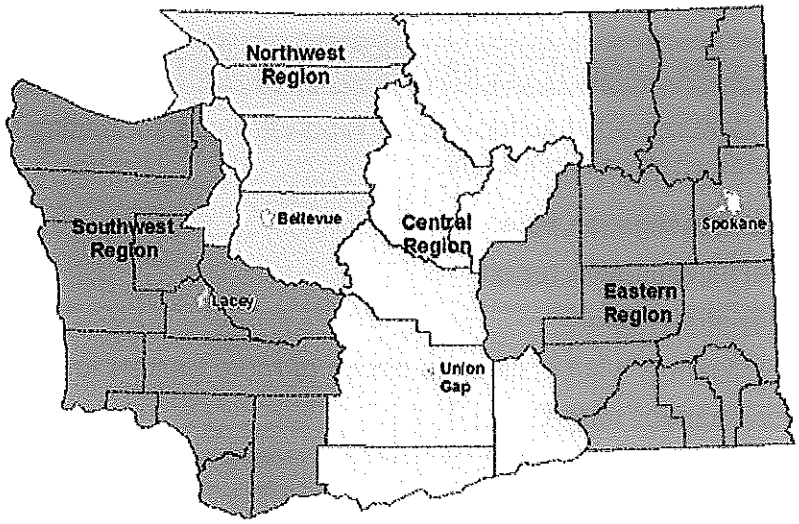
Step 3: REPRESENTATIONS AND SIGNATURE

The undersigned representative of the Customer hereby certifies that he or she is fully authorized to request services from Ecology under the Agreement for this VCP Project.

Name: Megan Nogeire			Title: Project Scientist
Signature: Megan Nogeire			Date: 3/15/16
Organization: PBS Engineering and Environmental			
Mailing address: 2517 Eastlake Ave E #100			
City: Seattle		State: WA	Zip code: 98102
Phone: 206-233-9639	Fax:	E-mail: megan.nogeire@pbsenv.com	

Step 4: SUBMITTAL

Please mail your completed form and the independent remedial action plan or report that you are requesting Ecology review to the site manager Ecology assigned to your Site. If a site manager has not yet been assigned, please mail your completed form to the Ecology regional office for the County in which your Site is located.



Northwest Region: Attn: VCP Coordinator 3190 160th Ave. SE Bellevue, WA 98008-5452	**Central Region:** Attn: VCP Coordinator 1250 West Alder St. Union Gap, WA 98903-0009
Southwest Region: Attn: VCP Coordinator P.O. Box 47775 Olympia, WA 98504-7775	**Eastern Region:** Attn: VCP Coordinator N. 4601 Monroe Spokane WA 99205-1295

If you need this publication in an alternate format, please call the Toxics Cleanup Program at 360-407-7170. Persons with hearing loss can call 711 for Washington Relay Service. Persons with a speech disability can call 877-833-6341.

DEPARTMENT OF ECOLOGY
State of Washington

Voluntary Cleanup Program

Washington State Department of Ecology
Toxics Cleanup Program

TERRESTRIAL ECOLOGICAL EVALUATION FORM

Under the Model Toxics Control Act (MTCA), a terrestrial ecological evaluation is necessary if hazardous substances are released into the soils at a Site. In the event of such a release, you must take one of the following three actions as part of your investigation and cleanup of the Site:

1. Document an exclusion from further evaluation using the criteria in WAC 173-340-7491.
2. Conduct a simplified evaluation as set forth in WAC 173-340-7492.
3. Conduct a site-specific evaluation as set forth in WAC 173-340-7493.

When requesting a written opinion under the Voluntary Cleanup Program (VCP), you must complete this form and submit it to the Department of Ecology (Ecology). The form documents the type and results of your evaluation.

Completion of this form is not sufficient to document your evaluation. You still need to document your analysis and the basis for your conclusion in your cleanup plan or report.

If you have questions about how to conduct a terrestrial ecological evaluation, please contact the Ecology site manager assigned to your Site. For additional guidance, please refer to www.ecy.wa.gov/programs/tcp/policies/terrestrial/TEEHome.htm.

Step 1: IDENTIFY HAZARDOUS WASTE SITE

Please identify below the hazardous waste site for which you are documenting an evaluation.	
Facility/Site Name: Mason County Transportation	
Facility/Site Address: 3740 Shelton Springs Road	
Facility/Site No: 23634752	VCP Project No.: SW0579

Step 2: IDENTIFY EVALUATOR

Please identify below the person who conducted the evaluation and their contact information.		
Name: Megan Nogeire		Title: Project Scientist
Organization: PBS Engineering		
Mailing address: 2517 Eastlake Ave E #100		
City: Seattle	State: WA	Zip code: 98102
Phone: 206-491-1220	Fax:	E-mail: megan.nogeire@pbsenv.com

Step 3: DOCUMENT EVALUATION TYPE AND RESULTS

A. Exclusion from further evaluation.

1. Does the Site qualify for an exclusion from further evaluation?

☒ Yes *If you answered **"YES,"** then answer **Question 2**.*

☐ No or Unknown *If you answered **"NO" or "UKNOWN,"** then skip to **Step 3B** of this form.*

2. What is the basis for the exclusion? *Check all that apply. Then skip to **Step 4** of this form.*

Point of Compliance: WAC 173-340-7491(1)(a)

☐ All soil contamination is, or will be,* at least 15 feet below the surface.

☐ All soil contamination is, or will be,* at least 6 feet below the surface (or alternative depth if approved by Ecology), and institutional controls are used to manage remaining contamination.

Barriers to Exposure: WAC 173-340-7491(1)(b)

☒ All contaminated soil, is or will be,* covered by physical barriers (such as buildings or paved roads) that prevent exposure to plants and wildlife, and institutional controls are used to manage remaining contamination.

Undeveloped Land: WAC 173-340-7491(1)(c)

☐ There is less than 0.25 acres of contiguous[#] undeveloped[±] land on or within 500 feet of any area of the Site and any of the following chemicals is present: chlorinated dioxins or furans, PCB mixtures, DDT, DDE, DDD, aldrin, chlordane, dieldrin, endosulfan, endrin, heptachlor, heptachlor epoxide, benzene hexachloride, toxaphene, hexachlorobenzene, pentachlorophenol, or pentachlorobenzene.

☐ For sites not containing any of the chemicals mentioned above, there is less than 1.5 acres of contiguous[#] undeveloped[±] land on or within 500 feet of any area of the Site.

Background Concentrations: WAC 173-340-7491(1)(d)

☐ Concentrations of hazardous substances in soil do not exceed natural background levels as described in WAC 173-340-200 and 173-340-709.

* An exclusion based on future land use must have a completion date for future development that is acceptable to Ecology.

[±] "Undeveloped land" is land that is not covered by building, roads, paved areas, or other barriers that would prevent wildlife from feeding on plants, earthworms, insects, or other food in or on the soil.

[#] "Contiguous" undeveloped land is an area of undeveloped land that is not divided into smaller areas of highways, extensive paving, or similar structures that are likely to reduce the potential use of the overall area by wildlife.

B. Simplified evaluation.

1. Does the Site qualify for a simplified evaluation?

☐ Yes *If you answered **"YES,"** then answer **Question 2** below.*

☐ No or Unknown *If you answered **"NO"** or **"UNKNOWN,"** then skip to **Step 3C** of this form.*

2. Did you conduct a simplified evaluation?

☐ Yes *If you answered **"YES,"** then answer **Question 3** below.*

☐ No *If you answered **"NO,"** then skip to **Step 3C** of this form.*

3. Was further evaluation necessary?

☐ Yes *If you answered **"YES,"** then answer **Question 4** below.*

☐ No *If you answered **"NO,"** then answer **Question 5** below.*

4. If further evaluation was necessary, what did you do?

☐ Used the concentrations listed in Table 749-2 as cleanup levels. *If so, then skip to **Step 4** of this form.*

☐ Conducted a site-specific evaluation. *If so, then skip to **Step 3C** of this form.*

5. If no further evaluation was necessary, what was the reason? *Check all that apply. Then skip to **Step 4** of this form.*

Exposure Analysis: WAC 173-340-7492(2)(a)

☐ Area of soil contamination at the Site is not more than 350 square feet.

☐ Current or planned land use makes wildlife exposure unlikely. Used Table 749-1.

Pathway Analysis: WAC 173-340-7492(2)(b)

☐ No potential exposure pathways from soil contamination to ecological receptors.

Contaminant Analysis: WAC 173-340-7492(2)(c)

☐ No contaminant listed in Table 749-2 is, or will be, present in the upper 15 feet at concentrations that exceed the values listed in Table 749-2.

☐ No contaminant listed in Table 749-2 is, or will be, present in the upper 6 feet (or alternative depth if approved by Ecology) at concentrations that exceed the values listed in Table 749-2, and institutional controls are used to manage remaining contamination.

☐ No contaminant listed in Table 749-2 is, or will be, present in the upper 15 feet at concentrations likely to be toxic or have the potential to bioaccumulate as determined using Ecology-approved bioassays.

☐ No contaminant listed in Table 749-2 is, or will be, present in the upper 6 feet (or alternative depth if approved by Ecology) at concentrations likely to be toxic or have the potential to bioaccumulate as determined using Ecology-approved bioassays, and institutional controls are used to manage remaining contamination.

C. Site-specific evaluation. A site-specific evaluation process consists of two parts: (1) formulating the problem, and (2) selecting the methods for addressing the identified problem. Both steps require consultation with and approval by Ecology. *See* WAC 173-340-7493(1)(c).

1. Was there a problem? *See* WAC 173-340-7493(2).

☐ Yes *If you answered **"YES,"** then answer **Question 2** below.*

☐ No *If you answered **"NO,"** then identify the reason here and then skip to **Question 5** below:*

- ☐ No issues were identified during the problem formulation step.
- ☐ While issues were identified, those issues were addressed by the cleanup actions for protecting human health.

2. What did you do to resolve the problem? *See* WAC 173-340-7493(3).

☐ Used the concentrations listed in Table 749-3 as cleanup levels. *If so, then skip to **Question 5** below.*

☐ Used one or more of the methods listed in WAC 173-340-7493(3) to evaluate and address the identified problem. *If so, then answer **Questions 3 and 4** below.*

3. If you conducted further site-specific evaluations, what methods did you use? *Check all that apply. See* WAC 173-340-7493(3).

- ☐ Literature surveys.
- ☐ Soil bioassays.
- ☐ Wildlife exposure model.
- ☐ Biomarkers.
- ☐ Site-specific field studies.
- ☐ Weight of evidence.
- ☐ Other methods approved by Ecology. If so, please specify:

4. What was the result of those evaluations?

- ☐ Confirmed there was no problem.
- ☐ Confirmed there was a problem and established site-specific cleanup levels.

5. Have you already obtained Ecology's approval of both your problem formulation and problem resolution steps?

☐ Yes If so, please identify the Ecology staff who approved those steps:

☐ No

Step 4: SUBMITTAL

Please mail your completed form to the Ecology site manager assigned to your Site. If a site manager has not yet been assigned, please mail your completed form to the Ecology regional office for the County in which your Site is located.

Northwest Region: Attn: VCP Coordinator 3190 160th Ave. SE Bellevue, WA 98008-5452	**Central Region:** Attn: VCP Coordinator 1250 West Alder St. Union Gap, WA 98903-0009
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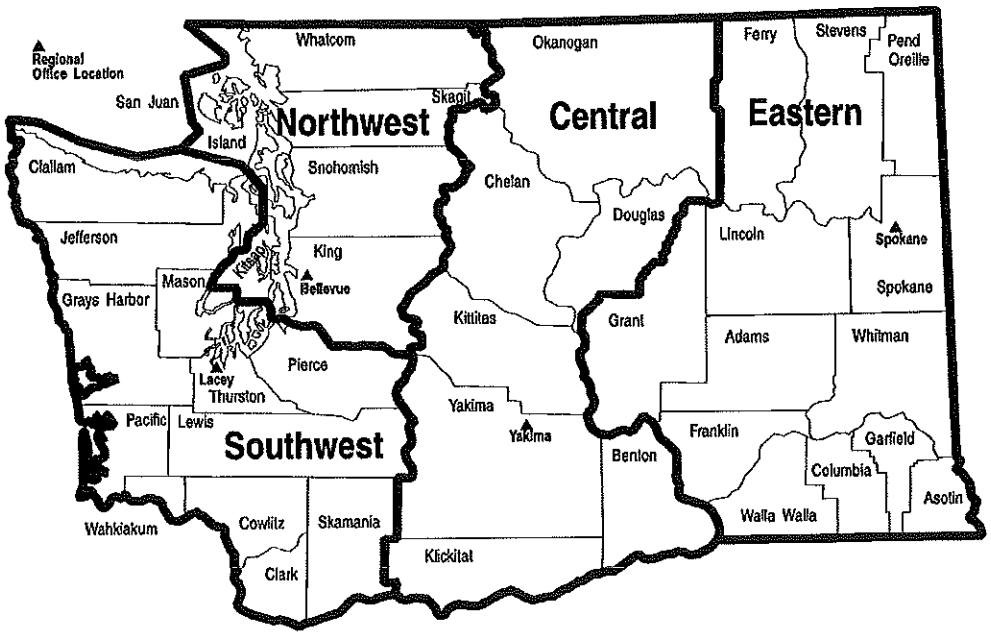

PBS | Engineering + Environmental

Feasibility Study: Evaluation of Cleanup Action Alternatives

Mason County Transportation Cooperative
3740 North Shelton Springs Road
Shelton, Washington

Prepared for:
Sandi Thompson
Mason County Transportation Cooperative
3740 North Shelton Springs Road
Shelton, WA 98584

February 29, 2016

Ecology VCP No. SW0579
Ecology F/S No. 23634752
PBS Project No. 41271.003

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1.0 ABBREVIATIONS AND ACRONYMS

The following abbreviations and acronyms that are commonly used in PBS Environmental Assessment and Remedial Investigation / Feasibility reports. Additional abbreviations and acronyms may be defined within the text.

AST – aboveground storage tank
ASTM – American Society for Testing and Materials
AUL – Activity and Use Limitation
bgs – below the ground surface
CEG – conditionally exempt generator (of hazardous waste)
CERCLA – Comprehensive Environmental Response, Compensation and Liability Act (EPA)
CMMP – Contaminated Media Management Plan
COC – Contaminant of Concern
cPAH – Carcinogenic Polycyclic Aromatic Hydrocarbons
CR2K – Community Right-to-Know
CSM – Conceptual Site Model
DCA – Disproportionate Cost Analysis
Ecology – State of Washington Department of Ecology
EPA – Environmental Protection Agency
ESA – Environmental Site Assessment
Feet bgs - feet below ground surface
Fbs – feet below surface
FS - Feasibility Study (per 340-173 WAC)
HOT – heating oil tank
LQG – large-quantity generator (of hazardous waste)
LUST – leaking underground storage tank
mg/kg – milligrams per kilogram (equivalent to parts per million, ppm)
MTCA – Model Toxics Control Act
NFA – No Further Action determination
NonGen – non-generator of hazardous waste
PAH – Polycyclic Aromatic Hydrocarbons
PCB – polychlorinated biphenyls
ppm – parts per million (equivalent to mg/kg)
RI – Remedial Investigation (per 340-173 WAC)
RCRA – Resource Conservation and Recovery Act (EPA)
SQG – small-quantity generator (of hazardous waste)
TPH - Total Petroleum Hydrocarbons
µg/Kg – micrograms per kilogram (equivalent to parts per billion, ppb)
µg /L – micrograms per Liter (equivalent to ppb)
UST – underground storage tank

2.0 INTRODUCTION

PBS Engineering and Environmental (PBS) prepared this Feasibility Study (FS) report on behalf of Mason County Transportation Cooperative for the property located at 3740 North Shelton Springs Road in Shelton, Washington (Site or property). This FS report was prepared to meet the requirements of the Washington State Model Toxics Control Act (MTCA), Chapter 173-340 (350-370) under Washington Administrative Code (WAC). The FS was required by Ecology to evaluate cleanup alternatives for the residual diesel contaminated soil originating from the prior underground storage tank system located on the project site.

2.1 Purpose

The purpose of the feasibility study is to develop and evaluate cleanup action alternatives to enable a cleanup action to be selected for the site. The feasibility study shall include cleanup action alternatives that protect human health and the environment (including, as appropriate, aquatic and terrestrial ecological receptors) by eliminating, reducing, or otherwise controlling risks posed through each exposure pathway and migration route.

2.2 Property Information

Site Name:	Mason County Transportation Cooperative
Site Address:	3740 Shelton Springs Rd N in Shelton, Washington 98584
Current Owner/ Operator	Mason County Transportation Cooperative
Owner Contact:	Ms Sandi Thompson 360.426.3182
Voluntary Cleanup Program Number:	SW0579
Ecology Facility/Site No.:	23634752
Project Consultant:	PBS Engineering and Environmental
Project Consultant Contact Information:	Megan Nogeire 2517 Eastlake Avenue East , Suite 100 Seattle, WA 98102 Office – 206.233.9639

The Site is bordered on the south and west by Shelton Springs Road, and beyond by Shelton High School and associated parking lots. Residential properties border to the north and vacant land to the east. The Site has been capped by asphalt and concrete since at least 1984.

3.0 REMEDIAL INVESTIGATIONS / REMEDIAL ACTION SUMMARY

The property was purchased as a vacant lot by the Mason County School District in 1984. Shortly after purchase, a school bus maintenance building and fueling facility were built. In 1994, the USTs were upgraded to conform to EPA standards. New double-walled fiberglass tanks were installed. The dispenser pumps and canopy remained and were connected to the new tanks. During the upgrade, a leaking pipe and contaminated soil were encountered during excavation. Mason County then initiated remedial actions to meet Ecology's Model Toxics Control Act (MTCA) requirements. A list of prior reports for the subject project is listed in Section 9.0 - References.

In September 1994, two 3,000-gallon gasoline USTs and one 12,000-gallon diesel UST were excavated and removed from the Site. Numerous confirmation soil samples were collected from the excavation. Concentrations of total petroleum hydrocarbons as diesel (TPH-Dx) above MTCA Method A soil cleanup level of 2,000 mg/Kg were present in five of the samples. These concentrations ranged from 5,000 mg/Kg to 12,400 mg/Kg. In addition, a soil sample collected

from a boring advanced adjacent to the pump island contained TPH-Dx at 21,000 mg/Kg at 2 feet bgs. Reportedly, no evidence of gasoline contamination in the soil was identified.

Mason County removed between 600 and 1,000 cubic yards of diesel contaminated soil from the excavation and aerated the soil material on-site in 1995.The soil was eventually thin-spread on site in 1998 following confirmation sampling results. Diesel impacted soil was left in place at two locations. One location is beneath the pump island (21,000 mg/kg) and the other at the north of the excavation towards the maintenance office building (5,000 mg/kg). Further excavation at these locations was determined to be not feasible due to the proximity of site structures.

In a letter dated May 1, 2007 additional site characterization was requested by Ecology. A total of five soil borings were advanced and two of the borings were completed as groundwater monitoring wells (MW3 and MW4). These two wells were installed to supplement two existing observation/monitoring wells (MW1 and MW2) likely installed during the original 1985 tank installation. Subsurface soil samples were collected from the borings, just above the saturated groundwater zone. Analytical results indicated no detections of gasoline or diesel range hydrocarbons in the six soil samples; with the exception of one sample location that detected heavy oil-range at low concentrations. All subsurface soil concentrations of petroleum hydrocarbons and/or constituents were below the applicable MTCA Method A or Method B Cleanup Levels.

Once MW3 and MW4 were completed and developed, the four monitoring wells (MW1-MW4) were sampled on June 28, 2007. Analytical results indicated no impacts to groundwater from petroleum hydrocarbon related constituents above the laboratory method reporting limits (MRLs).

In Ecology's opinion letter dated May 22, 2009, additional soil and groundwater characterization was requested. An additional round of groundwater sampling and five borings were advanced for the collection of soil samples was completed in October 2009. Sample analysis reported no contaminant of concern (COC) concentrations above the laboratory MRL.

Based on the October 2009 additional soil and groundwater data, PBS recommended that Mason County submit the findings to Ecology and request NFA determination for the site. However, the placement of additional monitoring wells and quarterly groundwater sampling was requested by Ecology in a letter dated May 26, 2010 in order to further characterize groundwater quality.

In September 2014, two additional monitoring wells were installed on the project site. The first well (MW5) was advanced along Shelton Springs Road to capture down gradient groundwater flow. The second well (MW6) was advanced near the western portion of the existing underground storage tank basin and dispenser area. The well installation and sampling results were presented in the Well Installation and Groundwater Sampling Report, PBS, dated October 2014. The analyzed soil and groundwater samples indicated no contaminant concentrations above the laboratory MRL or the adopted regulatory cleanup levels.

The second quarter groundwater sampling was completed in December 2014. The four wells (MW3 to MW6) were sampled with the exception of MW2, which did not have sufficient water to sample. The analyzed groundwater samples indicated no contaminant concentrations above the laboratory MRL or the adopted regulatory cleanup levels.

The third quarter groundwater sampling event was completed March 4, 2015. All wells (MW2 to MW6) were sampled. The analyzed groundwater samples indicated no contaminant concentrations above the laboratory MRL or adopted regulatory cleanup levels.

The fourth quarter groundwater sampling event was completed July 23, 2015. All wells (MW2 to MW6) were sampled. The analyzed groundwater samples indicated no contaminant concentrations above the laboratory MRL or adopted regulatory cleanup levels.

Groundwater monitoring data includes at least four consecutive quarter annual sampling events with no detection of COCs above the laboratory reporting limits.

4.0 CONCEPTUAL SITE MODEL

A Conceptual Site Model (CSM) was developed for the property using information from historical research and previous environmental investigations. The CSM includes a discussion of contaminants of concern, with an evaluation of occurrence and movement in affected or potentially affected media, to identify potential exposure pathways that could affect human health or the environment.

4.1 Contaminants of Concern and Occurrence

A release of diesel fuel associated with a former UST system, affecting soils was discovered during the tank system upgrades in 1994. The cause of the release was reported as a leaky fuel line running from the tank to the dispenser pump.

Waste Material: No known waste material is present at the Site

Soil: Based on subsurface investigation data it appears that residual diesel range petroleum-contaminated soil (PCS) is limited to the area beneath the pump island and northern extent of the former UST excavation limits. These areas are inaccessible for further characterization and or excavation.

Soil Contaminants of Concern

Soil samples collected across the Site have been analyzed for NWTPH-Gx, NWTPH-Dx, BTEX, and PAHs.

- NWTPH-Gx, BTEX, and PAHs have not been detected at concentrations above MTCA Method A or B cleanup criteria limits in soil, and therefore are not considered COCs at the Site.
- NWTPH-Dx was detected in five analyzed soil samples, as diesel range hydrocarbons, above the most stringent MTCA cleanup criteria. Therefore, NWTPH-Dx (diesel range) is considered a COC in soil at the Site.

Occurrence

Diesel contaminated soil is present within defined limits under the existing dispenser island and at the 10 to 15 foot depth along the northern limit of the tank basin excavation.

Groundwater: Based on groundwater quality data collected at the Site, groundwater concentrations of Site COCs are not considered to be a potential risk to human health or the environment.

Surface water: There is not a surface water body or significant drainage on the Site. Therefore, an evaluation of this media is not necessary.

Sediment: Sediment is not present on the Site. Therefore, an evaluation of this media is not necessary.

Air / Soil Vapor: Based on current soil and groundwater quality at the Site and current use of the property, soil vapor concentrations of Site COCs are not considered to be a potential risk to human health.

4.2 Potentially Complete Exposure Pathways

A potentially complete exposure pathway consists of: 1) an identified contaminant source; 2) a transport pathway to locations (exposure points) where potential receptors might come in contact with the contaminant of interest (COI); and 3) an exposure route (e.g., soil ingestion, vapor inhalation, drinking water) through which potential receptors might be exposed to COI.

Soil Exposure Discussion

Dermal contact for construction workers is identified as a potentially complete pathway. Because the current site is fully capped with concrete or asphalt, dermal contact, inhalation, and/or ingestion exposure pathways are not expected. Sub grade earthwork in these areas would be necessary for direct contact exposure by construction workers.

Vapor Intrusion Discussion

Petroleum hydrocarbons and constituents that can volatize from soil and groundwater media to indoor air is called vapor intrusion. The soil and groundwater investigations completed at the Site indicate concentrations do not exceed soil vapor screening levels. Vapor intrusion is not considered a complete pathway for the Site.

Migration to Groundwater Discussion

The migration from soil to groundwater exposure pathway is not considered to be complete based on the following:

- Four quarters of groundwater sampling has been completed at the site since September 2014. The analyzed groundwater samples indicated no contaminant concentrations above the laboratory MRL or adopted regulatory cleanup levels indicating that the localized diesel impacted soils have not migrated to groundwater.

5.0 IDENTIFICATION AND SCREENING OF TECHNOLOGIES

Appropriate technologies selected for evaluation address identified COCs, contaminant occurrence and movement, cleanup level criteria, and existing property conditions. The remedy approaches evaluated for the property are based on the findings of the remedial investigations and include:

- No action: The planned site usage is to remain as a school bus maintenance facility (no change).
- Contaminated soil removal: This technology would include the dismantling of site infrastructure, excavation of contaminated material, disposal of material at a licensed facility and site restoration. This technology would remove contaminants to regulatory cleanup criteria.
- Cap and Containment: This technology is typically used to provide engineering controls to maintain compliance with cleanup standards. A cap is placed over contaminated soil to minimize human health or ecological risk. Additionally, a cap can prevent rainwater infiltration that can mobilize contaminants.

Each selected technology or remedy was then ranked using the evaluation criteria discussed in Section 4.

6.0 EVALUATION CRITERIA

PBS used the criteria set forth in WAC 173-340-360, detailed below, to evaluate the each alternative.

6.1 Effectiveness

- Performance and reliability of the remedy to eliminate or reduce the risk associated with the identified COCs (in terms of toxicity, mobility, or volume) at the Site,
- Overall protection of public health and the environment,
- Compliance with selected cleanup levels,
- Permanence, long- and short-term effectiveness,
- Reliability of institutional controls.

6.2 Implementation

- Administrative and technical ease of the remedy with respect to the gains made in reducing Site COCs (e.g., equipment operations and maintenance, space limitations, equipment availability, resource availability, utility requirements, monitoring concerns, and operation and maintenance),
- Ability of the alternate to meet applicable federal, state, and local regulations and permitting requirements,
- Ability of the alternate to meet the project schedule and facility operations requirements.

6.3 Restoration Time Frame

- Potential risks posed by the site to human health and the environment,
- Practicability of achieving a shorter restoration time frame,
- Current use of the site, surrounding areas, and associated resources that are, or may be, affected by releases from the Site,
- Likely effectiveness and reliability of institutional controls,
- Potential future use of the site, surrounding areas and associated resources that are, or may be, affected by releases from the Site,
- Ability to control and monitor migration of hazardous substances from the Site,
- Toxicity of hazardous substances at the Site,
- Natural processes that reduce concentrations of hazardous substances and have been documented to occur at the Site or under similar site conditions,
- Potential risks to human health and the environment posed by the Site.

6.4 Alternative Cost

- Analyze the relative cost of each alternative based on the permanence, protectiveness, effectiveness, risk management, weighted against costs associated with estimated capital cost for construction, technical and administrative implementation and ongoing Operations and Maintenance (O&M).
  The estimated cleanup costs for the remediation alternatives may not be inclusive of all project costs.

6.5 MTCA Disproportionate Cost Analysis

The MTCA disproportionate cost analysis (DCA) is used to evaluate which of the alternatives that meet the threshold requirements are permanent to the maximum extent practicable. This analysis involves comparing the costs and benefits of alternatives and selecting the alternative with incremental costs that are not disproportionate to the incremental benefits. The evaluation

criteria for the disproportionate cost analysis are specified in WAC 173-340-360(2) and WAC 173-340-360(3), and include protectiveness, permanence, cost, long-term effectiveness, management of short-term risks, implementability and consideration of public concerns.

Capital Costs: These costs include expenditures for equipment, labor, and material necessary to install a remedial action. Indirect costs may be incurred for engineering, financial, or other services not directly involved with installation of remedial alternatives but necessary for completion of this activity.

Operation and Maintenance Costs: These are post-construction costs necessary to provide effective implementation of the alternative. Such costs may include, but are not limited to, operating labor; maintenance materials and labor; disposal of residues; and administrative, insurance, and licensing costs.

Monitoring Costs: These costs are incurred from monitoring activities associated with remedial activities. Cost items may include sampling labor, laboratory, analyses, and report preparation.

7.0 ANALYSIS OF CLEANUP ALTERNATIVES

Cleanup alternatives were developed from the general and specific remedial technologies and process options consistent with Ecology expectations identified in WAC 173-340-370, using best professional judgment, and guidance documents as appropriate. During the development of cleanup alternatives, consideration is given to both the current and planned future land use.

The alternatives presented herein consider potential risks posed to human health and the environment, practicality of achieving a reasonable restoration time frame, and current and potential future land uses, ability to control and monitor migration of hazardous substances at the site, toxicity of hazardous substances and natural attenuation processes.

This study has developed a rough order of magnitude cost estimates for each remedial action alternative (See Table 1).

7.1 Alternative 1: No Action

The planned site usage is to remain as a school bus maintenance facility (no change). The implementation of the no-action alternative does not prevent or interrupt identified human exposure pathways or seek to reduce toxicity, mobility, and volume, on a permanent or long-term basis, the identified COCs at the Site. However, the pocket of contamination is below the pump island and could only be accessed by persons working/repairing the structure. Natural attenuation will also occur over time and has likely decreased COCs in soil since 1994. The costs associated with this alternative would be zero.

7.2 Alternative 2: Contaminated Soil Removal - Excavation

The complete excavation of contaminated soil with off-site disposal at an approved facility would eliminate Site COCs to concentrations to levels below the selected cleanup levels and allow for unrestricted use of the Site. A soil removal plan would need to address implementation factors such as the volume of media to be excavated, excavation depths, construction timing and phases, disposal of excavated material, backfilling of the excavation areas and site restoration. This alternative would also require the dismantling and replacement of the existing pump island which would impede site business operations resulting in a significant loss of income from daily activities.

This alternative would be the most effective over the long-term and is considered to have high performance and reliability ranks, as the source material would be removed from the Site. The high relative costs associated with this alternative result in a low implementation score.

7.3 Alternative 3: Cap and Containment

The Site is already capped with asphalt that is in good condition. The capping on Site prevents human and ecological exposure to Site COCs through direct dermal contact. Capping also obstructs infiltration of precipitation that can increase contaminant mobility. During the four consecutive groundwater sampling rounds it was shown that the pocket of contamination has not migrated to groundwater and therefore the current capping on the property is effective.

As part of this alternative compliance monitoring would need to be completed. On-site personnel would inspect the cap to identify damage (cracks, potholes, etc.) and perform repairs as necessary to maintain impervious surfaces (asphalt, concrete).

Cap and Containment with compliance monitoring would effectively protect human health and the environment from a short-term perspective. It also ranks high in cost effectiveness as internal inspection costs are considered negligible. As needed, surface cap repair and replacement would be the largest maintenance costs.

8.0 RECOMMENDED CLEANUP ALTERNATIVE

Cleanup alternatives and remedial technologies were evaluated in context with site conditions and the Disproportionate Cost Analysis (DCA) as illustrated in Section 7 and Table 2. Remedial alternatives were further evaluated based on *Expectations for Cleanup Action Alternatives* (WAC 173-340-370). The recommended Cleanup Alternative is Alternatives 3.

Based on the DCA, the excavation of the isolated petroleum contaminated soil (Alternative 2) from the project site is considered disproportionate to benefits achieved by less expensive alternatives.

Alternative 3: Cap and Containment with Compliance Monitoring

The Site is already covered by a surface cap (structures, concrete and asphalt). Should re-development activities on site include removal of the cap, cleanup alternatives (such as Alternative 2) should be revisited at that time. On-site personnel will inspect the cap to identify damage (cracks, potholes, etc.) and perform repairs as necessary to maintain impervious surfaces (structures, concrete and asphalt).

9.0 LIMITATIONS

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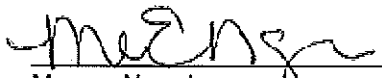
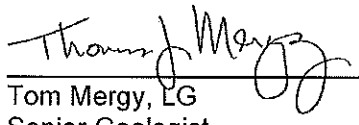
This Feasibility Study was used to develop and evaluate cleanup action alternatives that facilitate selection of a cleanup action plan for the Site that is protective of human health and the environment. The information and data received from the investigation and remedial activities on site determines the scope and applicability of each remedial alternative presented. However, the Feasibility Study does not answer all uncertainty regarding the Site and therefore, the expected accuracy of the costs may be less than that of estimates developed specifically for later phases of the cleanup process.

Sincerely,
PBS Engineering and Environmental Inc.



March 7, 2016
Megan Nogeire — Date
Project Scientist



March 7, 2016
Tom Mergy, LG — Date
Senior Geologist
Environmental Services Manager

10.0 REFERENCES

A Guide to Developing and Documenting Cost Estimates During the Feasibility Study: Publication No. EPA 540-R-00-002, July 2000.

Model Toxics Control Act Statute and Regulation; *Chapter 70.105D RCW, Chapter 64.70 RCW, Chapter 173-340 WAC:* Publication No. 94-06, Revised 2007.

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Site Monitoring Report, Fall 2009 – PBS Engineering and Environmental, January 2010.

Monitoring Well Installation and Groundwater Monitoring Report - PBS Engineering and Environmental, October 2014.

Terrestrial Ecological Evaluation – Exclusion Documentation, VCP SW0579, PBS, November 20, 2015.

Groundwater Monitoring Report December 2014 Event - PBS Engineering and Environmental, January 2015.

Groundwater Monitoring Report March 2015 Event - PBS Engineering and Environmental, March 2015.

Groundwater Monitoring Report July 2015 Event - PBS Engineering and Environmental, August 2015.

TABLE 1: REMEDIAL ALTERNATIVES COST ANALYSIS

Site: Mason County Transportation Cooperative, Shelton, Washington
Project No: 41271.003

Remedial Technology	Time to Implement (years)	Permanence[a]	Effectiveness[b]	Implementation	Performance and Reliability[c]	Best Estimated Costs[d]
1: No Action	n/a	2	1	4	1	5 - ($0)
2: Soil Removal: Excavation	1	5	5	1	5	1 - ($153,356)
3: Capping (w/ Maintance and Monitoring)	n/a	3	4	5	4	5 - ($5,000)

5 = Ranks very high compared to other alternatives

4 = Ranks relatively high compared to other alternatives

3 = Ranks about the same compared to other alternatives

2 = Ranks slightly lower compared to other alternatives

1 = Ranks low compared to other alternatives

[a] - Long term effectiveness in permanently reducing COCs to selected cleanup levels

[b] - Management of short term protection of human health and the environment

[c] - availablity of evidence that the remedy will eliminate or reduce the risk associated with the identified COCs (in terms of toxicity, mobility, or volume) at the Site

[d] - low costs are given a high rank and high costs are given a low rank

TABLE 2: DISPROPORTIONATE COST ANALYSIS

Site: Mason County Transportation Cooperative, Shelton, Washington

Project No: 41271.003

Costs are Rough Order of Magnitude Estimates and are not to be relied upon for contractor services. Site conditoions may change and influence the scope and estimated costs.			Alternative 1: No Action		Alternative 2: Contaminated Soil Removal - Excavation		Alternative 3: Cap and Containment	
	Units	Unit Rate	Units	Cost	Units	Cost	Units	Cost
Consultant Costs	1	LS		$ -		$ 2,720.00		$ -
Construction; removal and replacement of UST system infrastructure	LS	$ 25,000.00	0	$ -	1	$ 25,000.00	0	$ -
Construction: Temporary building support and Geotechnical Engineering during sub-structure excavation	LS	$ 25,000.00	0	$ -	1	$ 25,000.00	0	$ -
Site surface resoration (asphalt)	LS	$ 10,000.00	0	$ -	1	$ 10,000.00	1	$ 5,000.00
PCS Excavation and Transport (pump island area)	cubic yards	$ 55.00	0	$ -	200	$ 11,000.00	0	$ -
PCS Excavation and Transport (N. excavation limit)	cubic yards	$ 45.00	0	$ -	200	$ 9,000.00	0	$ -
PCS Disposal	Ton	$ 45.00	0	$ -	600	$ 27,000.00	0	$ -
Provide, place, and compact clean fill	Ton	$ 20.00	0	$ -	400	$ 8,000.00	0	$ -
Loss of Use; estimated 2 weeks	Event	$ 7,645.00	0	$ -	1	$ 7,645.00	0	$ -
SUBCONTRACTOR cost				$ -		$ 122,645.00		$ 5,000.00
LABORATORY	$/sample	$100.00			12	$ 1,200.00		
		TASK TOTALS		-		***$ 127,797.00***		***$ 5,000.00***
CONTINGENCY	***20%***			-		***$ 153,356.40***		***$ 6,000.00***